Use of Psychophysiological Portable Devices to Analyse Stress Response in Different Experienced Soldiers

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Abstract

Previous studies have shown that actuate stress have a negative effect on working memory, visio-spatial ability and symptoms of disassociation. We conducted the present research with the aim of to analyse the effect of experience and training in psychophysiological response, attention and memory of soldiers in combat. Variables of blood lactate, blood glucose, blood oxygen saturation, body temperature, heart rate, lower body muscular strength manifestation, autonomic modulation, cortical arousal, cognitive and somatic anxiety, and memory by a post mission questionnaire were analysed before and after a combat simulation in 49 soldiers of Spanish Army. Combat simulation produced a significant increase ($p < 0.05$) in blood lactate, blood glucose, blood oxygen saturation, rated perceived exertion, heart rate, cognitive and somatic anxiety. Significant increase in low frequency domain and significant decrease in high frequency domain of the heart rate variability was found in experienced and highly trained soldiers. The percentage of correct response in the post mission questionnaire indicated that elements better remembered were those related with soldier integrity and considered as a possible life threat, Significant differences in the post mission questionnaire by experience and training was also found. Correlation analysis showed that higher psychophysiological activation correlated positively with cognitive impairment and lower memory. As a conclusion, higher experienced soldiers presented higher physiological activation as well as cognitive and memory impairment than lower experienced soldier after a combat simulation and memory function was modulated by the stimulus nature.

Keywords:

Cortical arousal, Stress, Memory, HRV, Autonomic modulation, Psychophysiology